REMARKS

The Amended Claims

Support for the amendments to claims 5 and 15 is found, for example, at original claim 55, and at page 12, second paragraph of the description.

Amended claim 10 includes the subject matter of prior claim 12.

Support for new claims 60 and 62 is found at page 12, second paragraph of the description.

New claim 61 is based on prior claims 5 and 9.

New claims 63 and 64 are based on prior claims 25 and 26.

Support for new claims 65 and 66 includes prior claims 5 and 15 and the description at page 17, paragraph 3, which teaches that the density of undesirable current through defects in the light-emissive layer is inversely proportional to the product of the resistivity and the thickness of the adjacent electrode. In other words, for a given organic layer and a given operating voltage, the larger the product of the resistivity and thickness of the electrode the smaller the current density through any defects in the organic layer. Also, page 12, the second paragraph of the description includes some preferred ranges for the resistivity and thickness of the high resistance electrode layer. The minimum value of 0.005 Ohm.cm.cm specified in new claims 65 and 66 is the product of the smallest preferred value for the thickness (i.e., 0.5 microns (or 0.00005cm)) and the smallest preferred value for the resistivity (i.e.,100 Ohm.cm).

New claims 67-68 are based on prior claims 7 and 8.

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Response to 112 Rejections

The objected to "means for" language has been deleted.

Response to Prior Art Rejections

The patentability of the subject matter of claims 23-26 and 61 (based on original claim 9), has already been acknowledged by the Examiner in Section 13 of the office action.

U.S. Patent 5,482,896 (Tang) and U.S. Patent 6,091,078 (Codama) were cited against claims 1-2 and 10-11. Claims 1-2 and 11 have been cancelled. Claim 10 has been amended to include the features of claim 12, against which these references were not cited.

JP 08-008065 was cited against claims 1-8, 10-21, 27-34 and 36-58. The remaining amended claims 5-8, 10, 14-15, and 56-57 are patentable over JP 08-008065 for at least the following reasons.

The claimed invention relates to techniques for dealing with defects in the light-emissive layer of an organic LED. In contrast, JP 08-008065 is not concerned with this problem, but with the very different problem of improving the contrast of an organic electroluminescent device. JP 08-008065 describes a technique of providing a light-absorbing back electrode layer (4a in Figure 1) between a more conventional metal electrode layer and an active organic layer. It refers to the use of a thin (30 to 300nm) layer of black metal oxides and/or nitrides for the light-absorbing electrode layer. It also refers to the option of providing a thin (up to about 20nm) electron-injecting low work function layer between the light-absorbing electrode layer and the light-emissive layer.

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The specific example described at paragraph [0060] uses a 9nm Mg:Ag layer as the electron-injecting low work function layer and a 135nm layer of "conductive" black indium oxide as the light-absorbing layer.

Independent claims 5 and 15 of the present application each specify the use of an electrode layer having a thickness of at least 0.5 microns. There is no teaching in JP 08-008065 to use such relatively thick high resistance layer. In rejecting claim 55, the Examiner appears to have alleged that JP 08-008065 does disclose the use of a high resistance electrode layer having a thickness in the range of 0.5 to 1 micron. However, as discussed above, the maximum thickness referred to in JP 08-008065 for the light-absorbing electrode layer or electron-injecting layer is 300nm, i.e., 0.3 microns, which is less than the 0.5 micron minimum specified in amended claims 5 and 15 of the present application. Accordingly the subject matter of amended claims 5 and 15 is novel over JP 08-008065 for at least this reason.

Furthermore, since JP 08-008065 is not concerned with the same problem of improving uniformity of current density, it would not have been obvious to have used a light-absorbing layer or electron-injecting layer of significantly greater thickness than that taught in JP 08-008065.

Independent claims 64 and 65 of the present application specify the use of an electrode layer whose product of resistivity and thickness is at least 0.005 Ohm.cm.cm. There is no teaching in JP 08-008065 of the significance of providing an electrode layer whose product of resistivity and thickness is at least 0.005 Ohm.cm.cm. As could perhaps be expected from the very different problem to which JP 08-008065 relates, there is no reference in JP 08-008065 to suitable resistivity values for the material

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selected for the light-absorbing layer. At paragraph [0024], it is stated that the electron-injecting layer does not need to be as conductive as the overlying conventional metal electrode layer and that a material having a "resistivity" of up to about 1MOhm/sq. can be used; however, Applicant points out (a) that the units are different to the units of resistivity specified on page 12 of the present application; and (b) that this has to be considered in combination with the teaching of JP 08-008065 to make the electron-injecting layer only very thin (up to 20nm). Therefore, this does not constitute a teaching to provide a high resistance electrode layer, and particularly not an electrode layer whose product of resistivity and thickness is at least 0.005 Ohm.cm.cm.

Accordingly, the subject matter of independent claims 64 and 65 is also novel over JP 08-008065 for at least this reason. Furthermore, since JP 08-008065 is not concerned with the same problem of improving uniformity of current density, it would not have been obvious from JP 08-008065 to have used a light-absorbing layer or electron-injecting layer whose product of resistivity and thickness is at least the minimum value specified in claims 64 and 65.

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

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Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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